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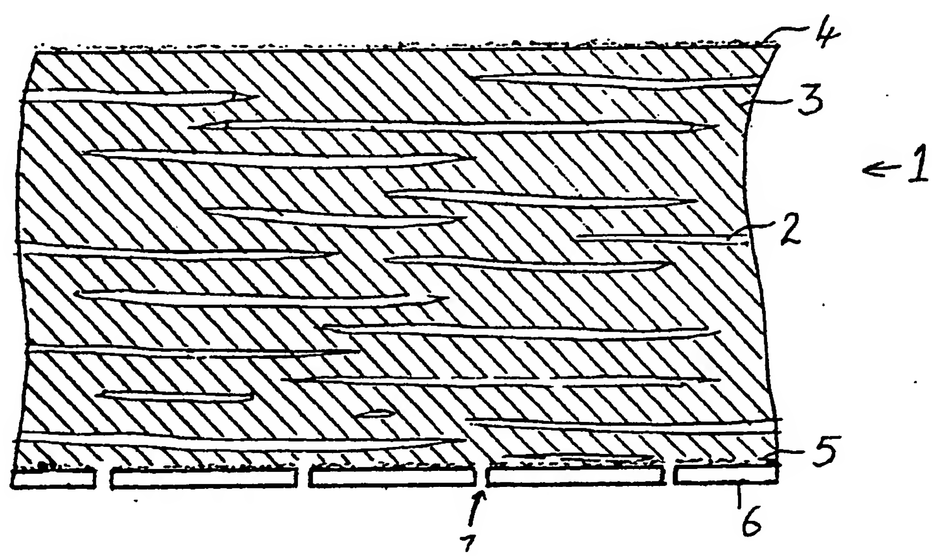
(54) **A roofing felt**

(57) An vapour permeable underslating felt comprises a bituminous layer 1 to the underside of which is bonded a polymer film 6 on which a thin reflective metal layer 5 is vapour deposited.



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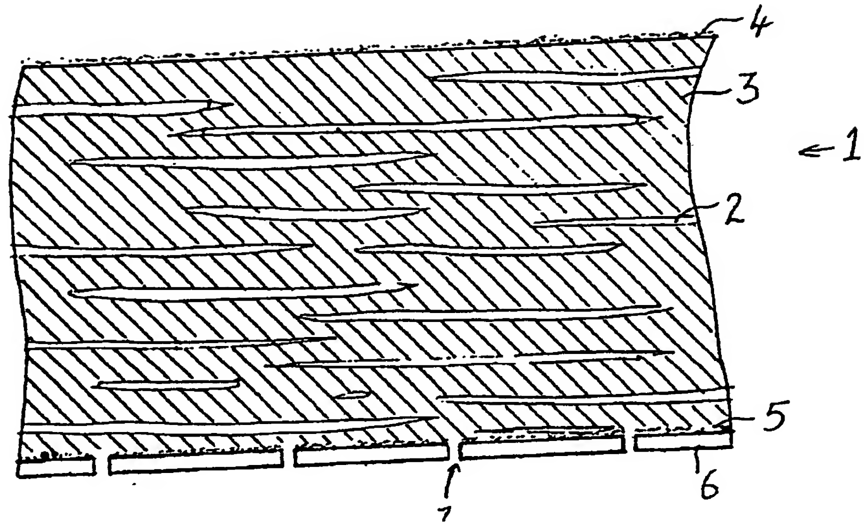

SPECIFICATION

A roofing felt

This invention relates to a roofing felt comprising a bituminous layer. It is particularly, though not exclusively, applicable to an "underslating felt" which is laid beneath tiles or slates to act as a second line of defence against the elements.

It is important that measures be taken to prevent condensation in spaces beneath roofs and for this reason a vapour permeable roofing felt is sometimes considered preferable to an entirely impermeable felt. British Standard BS 5534 Part 1 19 78 specifies a vapour permeability of 0.36 g/m^2 24 hrs.

It is also important to conserve heat within roof spaces. For this reason it has been known for many years to fix aluminium foil to the underside of a conventional underslating felt to provide reflectivity. The foil, bonded to the bitumen of the felt does however prevent the passage of water vapour and this can result either in condensation or the need for ventilation provisions which may cause consequential loss of heat. The metal foil makes no contribution to the strength of the felt and, because of its frailty, can easily be damaged when the felt is being drawn across rafters.

This invention provides a roofing felt comprising a bituminous layer one side of which is bonded to a film of synthetic plastics material, the latter being metalized to provide the roofing felt with heat reflecting properties.

The metal is preferably deposited on the synthetic film by evaporation of the metal and subsequent condensation of the vapour onto the synthetic film: a well known process generally referred to as "evaporation". An alternative would be to use an electrodeposition techniques akin to electroplating but this would require a preliminary step of depositing an electrically conductive material on the synthetic film. Either of these methods can produce a very thin layer which is permeable to air and to water vapour. Such a layer would be too thin to be self supporting and relies for its support on the synthetic film. The latter can be made sufficiently thin to be vapour permeable and yet have sufficient strength to reinforce the roofing felt as well as supporting the metal. Furthermore the synthetic film can be of a material which will stretch in sympathy with any stretching of the bituminous layer without causing a break in the metalization. Polymer materials are generally suitable for the film, polypropolenes and polyesters being preferred. It is possible for the unmetallized surface of the film to be bonded to the bitumen layer, but this is not preferred. It is considered better to bond the metalized surface to the bitumen. The film then protects the metal from oxidation or damage and needs to be transparent, at least to infra-red radiation. The bond between the film and the bitumen can be created either by application of heat to soften the bitumen, or by the use of a separate layer of adhesive.

In a preferred form of the invention improved vapour permeability is obtained by using a perforated film of synthetic plastics material. The number of holes is not critical and anything from five holes per square inch upwards is considered to be beneficial.

The bituminous layer may be formed by a carrier of non-woven synthetic fibres which is impregnated and possibly also coated with bitumen or a bituminous based mixture. The use of synthetic fibres is preferred because of their resistance to decay and they are preferably non-woven since this is believed to give improved vapour permeability. Natural and/or woven fibres e.g. in the form of hessian cloth could however alternatively be used.

One way in which the invention may be performed will now be described by way of example with reference to the accompanying drawing which is a greatly magnified cross-section (not shown to scale) through a piece of underslating felt constructed in accordance with the invention.

The illustrated felt is nominally of 22 kgs per 40m × 1m roll and comprises a bituminous layer 1 formed from non-woven polyester/polyamide fibres 2 having a dry weight of between 75 and 200 grms per m^2, preferably 125 grms per m^2. This is impregnated and coated with bitumen 3. The upper surface of the bituminous layer 1 has a coating of talc 4 to prevent self-adhesion. Its lower surface is bonded to a thin aluminium layer 5 formed by evaporation onto a film 6 of polypropolene. The weight of the film 6 is 20 grms per m^2, its thickness is 20 microns, and it is provided with approximately seven perforations 7 per square inch except, for improved strength, along border regions close to the edges of the film 6. The perforations are approximately 1.2 mms in diameter but are not shown to scale on the accompanying drawing. The film 6 is transparent, thereby allowing the metal layer 5 to provide a reflective lining to a roof cavity for reasons of heat conservation.

The bituminous layer 1 is vapour permeable and, because of the perforations 7, so is the aluminium layer 5 and the film 6. Indeed because of the very thin nature of the aluminium layer 5 and film 6, the combined structure has a vapour permeability of 0.398 grm/m^2 24 hrs at 75% RH 25°C, even without provision of the holes 7 which are therefore considered to be a preferred but inessential feature.

The illustrated construction is given considerable strength by the film 6 allowing it to remain exposed for a considerably longer period prior to tiles placing and giving it improved resistance to bursting. It has good reflectivity to reduce heat loss, keeping the roof space warmer in winter, and yet it will

not tarnish like conventional aluminium foild. It is permeable to vapour but totally waterproof and provides a light clean roof lining.

Because of the very thin nature of the metal layer it has been found not to mask T.V. signals to a significant extent. Furthermore it will not easily snag on rafters during installation; is lightweight and easy to install; and has improved burst resistance gained from the relatively high stretch capability of conventional reinforced underslating felt.

The illustrated construction is also believed to overcome one of the most serious drawbacks of conventional felts, incorporating paper and hessian, which because of their hygroscopic and organic nature quickly rot away at the eaves, where the felt of necessity overhangs into the gutter. This is known to cause rot of timber wall plates and the bottom ends of rafters because, having rotted away, the felt no longer serves its primary function: namely to direct harmlessly into the gutters water which has either penetrated through the slates or tiles or which has condensed on the undersides of them.

CLAIMS

1. A roofing felt comprising a bituminous layer one side of which is bonded to a film of synthetic plastics material the latter being metalized to provide the roofing felt with heat reflecting properties.

2. A roofing felt according to Claim 1 in which the film of synthetic plastics material has perforations distributed over its surface.

3. A roofing felt according Claim 1 or 2 in which the synthetic plastics material has a metal layer evaporated onto it.

4. A roofing felt according to any preceding Claim having a vapour permeability of not less than 0.36 g/m^2 24 hrs.

5. A roofing felt according to any preceding Claim in which the film of synthetic plastics material is metalized on a side which faces the bituminous layer and in which the synthetic plastics film is transparent to infrared radiation.

6. A roof structure comprising a roofing felt according to any preceding Claim laid beneath a tile or slate exterior.

7. A roofing felt substantially as described with reference to the accompanying drawings.

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